Assessment of quality of life in total edentulous patients rehabilitated with implants and fixed prosthesis

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Aim: Tooth loss is very prevalent in Brazil, reflecting high demand for dental services, especially those related to oral rehabilitation. This study aimed to assess the quality of life in total edentulous patients rehabilitated with implants and fixed prosthesis. **Methods:** Thirty-two patients were evaluated before and after rehabilitation with dental implants and fixed prosthesis using the OHIP-14 questionnaire and the Visual Analogue Scale (VAS) after 6 months follow-up. **Results:** OHIP-14 revealed a significant improvement after treatment in all seven parameters and in the global score (P < 0.001). VAS presented positive results related to patient satisfaction regarding oral rehabilitation, except for the hygiene of the fixed dentures. **Conclusion:** At the end of this study, OHIP-14 scores decreased by 50% in most of the questions raised, and VAS presented positive results, except for hygiene of the fixed dentures, presenting an improvement in the quality of life of total edentulous patients after rehabilitation with implants and fixed prosthesis.

Keywords: dental implants. dental prosthesis. Oral health. Quality of life.

Introduction

In Brazil, there is a high prevalence of edentulousness[1]. Edentulism is an important public health issue, presenting a strong negative impact on the patients' quality of life, expressed by the loss of functional abilities, as mastication and phonation, as well as nutritional, aesthetic and psychological losses, with direct influence in the reduction of self-esteem and social integration[2-5].

It is known that teeth are key factors to facial harmony and to the smile, which are determinant factors in the patients' quality of life[1,6]. Fully edentulous patients show a preference towards implant-supported fixed rehabilitations, because they provide greater masticatory effectiveness and comfort, require less repair and lower mainte-nance, besides favoring the psychological aspect, since it remains still in the mouth[3-5].

The scientific and technical advances in dentistry, especially in the field of oral rehabil-itation, have been seeking to restore occlusal stability and, consequently, promoting facial harmony with the aid of implants, which can delay the physiological resorption of the bone, increasing the removable prostheses retention and seeking to improve the patients' quality of life[7].

. It is important to verify if the rehabilitation of edentulous patients with implants and fixed prosthetics can present some impact on its quality of life, in order to determine the best treatment modality and factors that can affect this outcome. Therefore, this study aimed to access the quality of life of total edentulous patients before and after rehabilitation with implants and fixed prosthesis. The hypothesis of the study was that the rehabilitation of total edentulous patients with implants and fixed prosthesis improves the quality of life.

Material and Methods

The sample size calculation determined a required sample of 32 patients for a 95% confidence level, 80% power and 50% estimated reduction in OHIP scores, using as base reference a mean (standard deviation) OHIP score of 13.5 (13.0) before inter-vention[8].

After the approval of the Research Ethics Committee of the Lutheran University of Brazil (CAAE 49943415.0.0000.5349), informed consent was obtained from the participants to the performance of this prospective study. All procedures performed in this study involving human participants were in accordance with ethical standards of the institu-tional and/or national research committee, as well as with the 1964 Helsinki declara-tion and its later amendments or comparable ethical standards. Patients treated at the Implant Dentistry Specialization Course were included using the following criteria:

a) fully edentulous patients or those with indication of extraction, treated with dental implants and full fixed rehabilitation in the maxilla and / or mandible;

b) both sexes;

c) patients who agreed to participate by signing an informed consent form;

d) treatment completed within at least six months of follow-up.

The OHIP Questionnaire 14 was used as reference, due to its great reliability in international research, giving more credibility to the research to evaluate the impact of oral rehabilitation on patients' quality of life.. This questionnaire uses seven categories (functional limitation, physical pain, psychological discomfort, physical limitation, psychological limitation, social disability and incapacity) with two objective questions each, with responses ranging from 1 to 5. Responses were summarized in a 6-point Likert scale. For each of the categories, the average of the two questions addressed was calculated, and the total average of the seven categories before and after the rehabilitation treatment was calculated.

The Visual Analogue Scale (VAS), which ranges from 0 to 10 (0: completely dissatisfied and 10: completely satisfied), was used to evaluate the patients' general satisfaction, comfort and stability, aesthetics, ease of cleaning, ability to speak, self-esteem and functionality after rehabilitation with dental implants.

The patients answered the OHIP-14 questionnaire before and after 6 months of the treatment with dental implants and fixed prosthesis, and the VAS only at 6 months follow-up. VAS ratings were transferred to a ruler tabulated in millimeters and centimeters (10cm) in order to obtain a numerical value referring to the satisfaction corresponding to each patient.

A descriptive analysis of the results was performed to analyze the results of the VAS, which also has full digit data, ranging from zero to 10, and that evaluated the degree of satisfaction of patients treated with dental implants and fixed prosthesis, in relation to the seven previously mentioned parameters.

Data obtained were tabulated and statistically analyzed (SPSS 21.0 software, IBM Corp, Armonk, NY). The non-parametric Wilcoxon test was applied, with a significance level of 5%.

Results

Thirty-two patients were interviewed using the OHIP-14 questionnaire before and after implant placement, and the VAS exclusively related to implant rehabilitation.

Analyzing the OHIP-14 questionnaires before and after treatment, there was a significant difference in the results presented before and after the treatment, and it was verified that dental implants and fixed prosthodontic rehabilitation had a positive impact in all seven parameters and in the global score evaluated by the OHIP-14 questionnaire ($P < 0.001$), as presented in Table 1.

Table 1. Results (mean ± standard deviation) of the parameters before and after treatment with dental implants obtained through the OHIP-14 questionnaire.

Parameters	Before	After	P-value
Functional limitation	3.89 ± 0.95	2.11 ± 1.48	P < 0.001
Physical pain	4.38 ± 0.88	1.38 ± 0.77	P < 0.001
Psychological discomfort	4.48 ± 0.94	1.42 ± 0.87	P < 0.001
Physical limitation	4.25 ± 0.74	1.06 ± 0.31	P < 0.001
Psychological limitation	4.59 ± 0.71	1.09 ± 0.43	P < 0.001
Social disability	4.05 ± 0.85	1.06 ± 0.35	P < 0.001
Incapacity	4.11 ± 1.04	1.09 ± 0.55	P < 0.001
Global score	4.25 ± 0.91	1.32 ± 0.85	P < 0.001

As for the VAS score, in terms of general satisfaction with implants, comfort and stability, aesthetics, ability to speak, self-esteem and functionality, patients were totally satisfied. All 32 patients answered 10 for these questions. Regarding the ease of cleaning (7.8 ± 2.72), 12 of the 32 patients gave results below 7 and eight of them below 5.

Discussion

Oral rehabilitation with dental implants has resulted in great patient satisfaction, although there are still few studies that address the patient's opinion and aspirations regarding this approach[9]. Rehabilitation is of paramount importance when it comes to improving the quality of life, by reestablishing the edentulous patient's health, physical, psychological and social well-being. Based on the presented results, the study hypothesis can be confirmed.

The OHIP questionnaire was created by Slade & Spencer as a tool to evaluate the impact of the oral condition on the quality of life of the individuals and population. Initially, it comprised 49 questions (OHIP-49) and was later reduced to 14 questions (OHIP-14), which was considered effective to determine the same associations with clinical and socio-demographic factors that were observed using OHIP-49. The reduced questionnaire accurately assesses the efficacy and success of the treatment through different prosthetic parameters[10,11].

This study followed the methodology of another study, which also used two OHIP-14 questionnaires to identify the patient's perception regarding restorative treatment with implants, where the final mean values closer to zero indicate a better quality of life of the individuals after oral rehabilitation with implants and fixed prosthesis[12].

A study performed with a sample of 22 patients fully edentulous and maxillae rehabilitated with zygomatic implants and fixed prosthesis, used the OHIP-14 questionnaire before and after treatment and found that the end-time rehabilitation had a positive impact in most categories ($P < 0.05$)[13], which is in accordance with the results of this study. It is important to emphasize that the results of the present study on the OHIP scores was, in most aspects, a reduction of 50% of the baseline values, indicating a great improvement related to the patients' quality of life. Another study evaluated 58 patients rehabilitated with implant-supported prostheses and a mean follow-up of 13.7 years. Patients also answered the OHIP-14 questionnaire and it was noted that they were satisfied with the quality of the rehabilitation, with older patients showing greater satisfaction when compared to younger patients[14].

In the present study, it was verified an average OHIP score of 13.5 before intervention. At the end of the study, it was managed to reach an average score of 4, representing a score reduction greater than 50%, confirming a very significant improvement in quality of life. A survey of patients that used conventional prostheses and replaced them with implant-supported prostheses evaluated the effects of treatment, and concluded that there was improvement in neuromuscular adaptation, bone tissue preservation and improvement of masticatory function[15].

As for the parameters analyzed in the VAS scale (comfort and stability, aesthetics, ease of cleaning, ability to speak, self-esteem and functionality after rehabilitation with dental implants), it was verified an 100% satisfaction in four questions (comfort and stability, aesthetics, ability to speak, self-esteem and functionality), and nearly 100% in one question (ease of cleaning), demonstrating a high degree of satisfaction of the patients involved in this research.

The issue that addressed the ease of cleaning was the last degree of contentment after treatment, where patients reported that oral hygiene became more complex in comparison to the dentures previously used, which is easily understandable, since the hygiene of a fixed implant based prosthesis require more training and more dedication time, besides the use of specific hygiene instruments such as dental floss guides, interdental brushes, among others.

It is necessary to emphasize that this study is limited on the evaluation of patients reports after a short follow-up period (6 months), an that not necessarily reflects the patient long-term satisfaction. However, a previous study that evaluated patients satisfaction and oral-health related quality of life after ten years of implant placement presented results similar to those of this study[16], suggesting that such parameters are mantained over time. Still, further studies evaluating the patient's quality of life after a short- and long-term follow-up periods are necessary.

In conclusion, based on the findings of this study, it is possible to conclude that the rehabilitation of total edentulous patients with implants and fixed prosthesis positively influenced on their quality of life.

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Author Contribution

Alexandre da Silveira Gerzson: Conceptualization, data curation, formal analysis, investigation, methodology, project administration, resources, supervision, validation, visualization, writing - original draft.

Brenda Ledur Lauxen: Data curation, investigation, methodology, project administration, resources, supervision, validation, visualization, writing - original draft.

Theodoro Weissheimer: Data curation, formal analysis, writing – review & editing. Elizangela Paludo: Data curation, formal analysis, writing – review & editing.

Luís Artur Zenni Lopes: Data curation, formal analysis, writing – review & editing.

All authors have actively participated in the discussion of the manuscript's findings and have revised and approved the final version of the manuscript.

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